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Photochemical immobilization of heparin, dermatan sulphate, dextran sulphate and endothelial cell surface heparan sulphate onto cellulose membranes for the preparation of athrombogenic and antithrombogenic polymers.

Erdtmann M, Keller R, Baumann H.

RWTH Aachen, Germany.

Heparin (HE), dextran sulphate (DX) of molecular weight 40000 and 500000, dermatan sulphate (DS) and endothelial cell surface heparan sulphate (ES-HS) were immobilized covalently onto cellulose membranes (Visking dialysis tubes) using the photochemical heterobifunctional reagent 4-azido-1-fluoro-2-nitrobenzene (AFNB). 120 pmol HE/cm² and 40 pmol DS/cm², 3.4 pmol DX 500,000/cm², 50 pmol DX 40,000/cm² and 3.6 pmol ES-HS/cm² were immobilized. The platelet adhesion of the modified membranes was measured in a modified Baumgartner perfusion chamber with citrated human blood at a defined shear rate. Membranes modified with DX 40,000 and DX 500,000 showed 80% and 30% platelet adhesion, respectively, heparinized and DS coated membranes showed 50% and 60% platelet adhesion, respectively, compared with a subendothelial matrix (100% platelet adhesion). ES-HS modified membranes showed no platelet adhesion.

PMID: 7888574 [PubMed - indexed for MEDLINE]

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